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**STRATEGIC MOBILITY - DOES THE UNITED STATES  
HAVE THE STRATEGIC LIFT TO GET TO OUR  
NEXT WAR AND REMAIN FOR THE DURATION?**

A Monograph

by

**Lieutenant Colonel John P. Dunigan  
Ordnance Corps**

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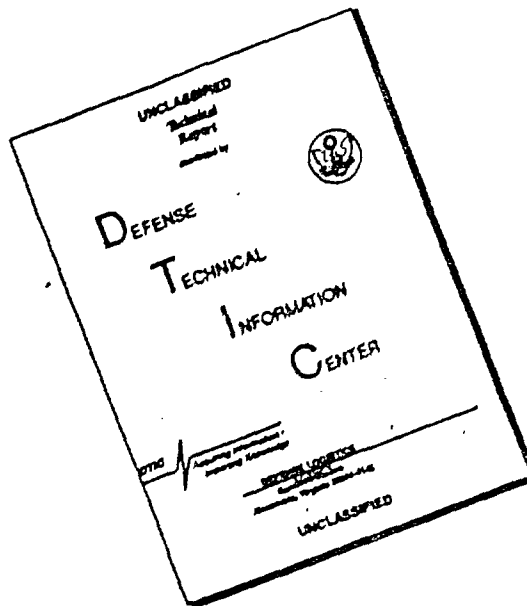


**School of Advanced Military Studies  
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A special application of mobility, the Berlin Airlift, offers an example of the strengths and weakness of the fastest but most expensive form of mobility. The state of the United States strategic fleets is also examined to provide the reader an assessment of this country's ability to execute its national policy and these fleets' readiness in future years.

The monograph concludes that, despite some long-term improvement in our ability to project our military power to foreign wars and that what ability we do possess is seriously eroding. There is no shortage of studies and reviews on this topic, but there are few deeds that implement the proposed solutions. The United States cannot perform the strategic mobility realities of global war.

Strategic Mobility—  
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Strategic Lift to Get to Our Next War  
and Remain for the Duration?

by

Lieutenant Colonel John P. Dunigan  
Ordnance Corps

School of Advanced Military Studies  
U.S. Army Command and General Staff College  
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# ABSTRACT

STRATEGIC MOBILITY--DOES THE UNITED STATES HAVE THE STRATEGIC  
LIFT TO GET TO OUR NEXT WAR AND REMAIN FOR THE DURATION? by  
LTC John P. Dunigan, USA 32 pages.

Strategic mobility has evolved for hundreds of years, most famously characterized by Nathan Bedford Forrest's words about when to get there and with how much. Not until the application of the railroad to military needs, did any large scale improvement occur in what to carry and how much. Today, technology has made available a variety of means to transport armed forces around the world and to resupply them to remain in a theater for an indeterminate length of time. This document examines the capacity of the United States Armed Forces to be projected into foreign areas of conflict.

This monograph reviews how strategic mobility has been used in the past during peace and war as a demonstration of how much this war fighting capacity helped or hindered the forces it supported. Napoleon, during his preparation for his Russian campaign, and the Allies of World War II, preparing for the Normandy invasion, provide excellent examples of the value of being able to move large bodies of forces and material over multiple routes. A special application of mobility, the Berlin Airlift, offers an example of the strengths and weakness of the fastest but most expensive form of mobility. The state of the United States strategic fleets is also examined to provide the reader an assessment of this country's ability to execute its national policy and these fleets' readiness in future years.

The monograph concludes that, despite some long term improvements in the airlift mobility leg, there is no overall improvement in our ability to project our military power in foreign wars and that what ability we do possess is seriously eroding. There is no shortage of studies and reviews on this topic, but there are few deeds that implement the proposed solutions. The United States cannot perform the strategic mobility realities of global war.

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## I. INTRODUCTION

Since the end of WWII, the United States has followed a strategy of forward defense which has been adjusted to greater or lesser degrees by each administration since that of President Truman. The most ambitious enhancement has been the prepositioning of equipment in Central Europe in the late 1960's. What began as a modest two-division complement of equipment has, today, grown to a six-division set. The rationale for this facet of our strategy was that prepositioned equipment would facilitate a rapid reinforcement of forward deployed units by follow-on forces from the Continental United States (CONUS).

The next challenge was to determine how these forces were to be resupplied. The problem of supporting a large army is a very difficult one.[2:141] This issue was partially answered by expanding our war reserves, both at the theater and corps level. The object of this expansion was to create a minimum of 60 days of supply for all potential theaters of war through Prepositioning of Materiel Configured to Unit Sets (POMCUS), other forms of prepositioning, and increased stockage levels in US depots of all classes of supply. In some cases we have met that requirement; and continue to work those that have not met the objective. The United States now has several theaters well prepared for a 60-day war. The assumption underlying this is that the country will be able to mobilize in that time and to obtain the mobility necessary to reinforce the theater.

The Army's war-fighting doctrine, as described in FM 100-5, Operations, asserts that operations in the foreseeable future will be fought in one of two basic environments. One environment may be an anticipated theater of war with an existing support structure of communications, air defense, logistics facilities, and ports. The other may be a relatively immature theater where Army leaders within a joint or combined context will have to choose between creating such a support base in the theater or fighting with only external support.[22:2] Future conflicts will most likely be at some distance from the United States. To defend these areas and to honor our obligations, we must be able to get to these theaters quickly with sufficient force to deter our enemies, or to fight them if need be. We must also have the ability to remain there long enough to complete the task, even if it exceeds the short war scenario.

The United States has made an enormous investment in Central Europe to shorten the deployment time for early COMUS-based forces. Unfortunately, our strategy demands that we must also be prepared to do the same in other theaters concurrently and to support such forces for a prolonged period should our short war aspirations fail. This requirement is based on the premise that our prepositioned war reserves are configured to bridge the difference in time necessary to bring the United States industrial base to wartime production levels and move these

newly-produced supplies to the combatant theater. For planning, this period is normally assumed to be 60 days. The Commission on Merchant Marine and Defense has estimated our military and domestic needs at the outbreak of war to require 20.3 million tons of cargo and equipment shipping. By the year 2000 the Commission estimates that the requirement will be 24 million tons.(32:19-21)

For these reasons it is essential that we continually evaluate our ability to move strategic forces to distant war zones and, if need be, to remain there until the cessation of hostilities. We must answer this question: Does the United States currently have the assets to provide the strategic air and sea lift required to deploy and sustain its forces, in order to protect its treaty obligations and interests? This paper seeks information relevant to answer this question and suggest where we can improve our deployment and resupply capabilities.

"Mobility" for this work means a combination of sealift and airlift. I have defined "conflict" to be operations in excess of 60 days and have not considered the effects of any enemy action on our mobility or any normal degradation of these fleets due to equipment failure. What I have included in my estimates of our strategic mobility is a projected status of this nation's maritime fleet and, to the extent available, our airlift fleet. Specific details of prepositioned war reserves are beyond the

scope of this paper. Also excluded from this discussion are reception ports and airfields and their ability to receive and clear cargo, equipment, or troops. This paper assumes 1987 Defense Guidance of a global, conventional three-theater war. Theory and history will be examined to provide us with much of the logic for strategic mobility requirements and to enhance our understanding of why such mobility is so vital to national security. The study also examines the current condition of the United States' mobility assets and their projected status at the turn of the century. The effects of programmed mobility enhancements will also be reviewed. The paper concludes with a brief analysis of the pros and cons of various solutions to the strategic mobility shortfall.

## II. STRATEGIC MOBILITY

From the American perspective, strategic mobility is the movement of bodies of forces and their sustaining supplies from the continental United States to any of our war-fighting theaters. Operational mobility is the distribution of those forces and supplies from the port of debarkation to the battle area. Tactical mobility is the movement of those forces and supplies on or in close proximity to the battle area.

Strategic mobility is an unquestioned requirement for the United States because of its wide variety of global responsibilities.

Our global support and mobility capabilities, including airlift, sealift and prepositioning are essential to allow us to meet military challenges around the periphery of the Eurasian continent, which remains the primary locus of Soviet expansionist interests. Prepositioning ashore or at sea sharply reduces our response time. Airlift, the most flexible of our mobile assets, would deliver initial reinforcements in most contingencies with sealift carrying the bulk of our reinforcements and resupply.[29:9]

Theorists and field commanders have, for centuries, clearly understood the need to move armies and their equipment. Possession of the means of conveying supplies with or after the army is indispensable in the conduct of war and constitutes one of war's greatest difficulties, particularly during rapid expeditions.[2:144] This need is greater today than in the time which Jomini wrote. Our wars will be fought at a faster tempo, will consume much more and will be conducted in overseas areas. The rules of all forms of warfare also impose restraints upon combatants today that 150 years ago were of less concern. The large armies that invaded Belgium and Germany sometimes lived in the houses of the people, sometimes by requisitions laid upon the country, and often by plunder and pillage.[2:142] This would

not be tolerated today by any civilized government and, more to the point, would not provide the types nor the quantities of supplies necessary for a modern mechanized or armored force.

The nuts and bolts of replenishment must still be accomplished for any force to be effective.

Before a commander can even start thinking of maneuvering or giving battle. . . , in short of putting into practice the whole rigmarole of strategy, he has or ought to make sure of his ability to supply his soldiers with those 3000 calories a day without which they will very soon cease to be of any use as soldiers.[8:1]

The reference to calories is only illustrative - the point is that preparation for war is very much more than identifying objectives and the forces necessary to secure them. There is a vital need to ensure that the material for war and the means to move it are as well planned as the movements and maneuvers of combat units. Napoleon, one of history's great soldiers, is normally remembered as a poor logistician because of his inability to sustain his 1812 campaign in Russia. His example offers a lesson that sustainment plans, no matter how detailed, can still fail upon execution.

"Napoleon's march into Russia was well planned and prepared for with supplies and men, far in excess to anything done previously. Napoleon knew full well of the difficulty of war in Russia from both history and his own experiences in Poland." [8:62]

Napoleon accumulated vast quantities of supplies for his army on its Russian campaign. Concurrently, he assembled the necessary transportation for this stockpile. His service train was vastly expanded until it numbered no less than 26 battalions, 8 of which were equipped with 600 light and medium vehicles each. The rest had 252 four-horse wagons, each capable of carrying 1.5 tons.[8:63] This was a far-sighted move to prepare a large force in every conceivable way for the campaign.

The notion that this was a lost campaign for lack of effort in preparation is false. The Russian campaign was exceptionally well-prepared for in terms of stockpiling supplies and assembling transportation for what, in that day, was considered a move of strategic distances in support of his objectives. However, even though he had prepared extensively, his efforts were not sufficient. In short Napoleon was a soldier competent enough to see the need for strategic mobility; but the realities of early nineteenth century mobility means ultimately contributed to his defeat, despite his prodigious efforts.

The staff that planned Operation "OVERLORD" also recognized the significance of strategic mobility; but unlike Napoleon, they had much more capable means at their disposal. These men were well aware that the success of the Allied invasion of Europe would depend to a large extent on their ability to commit troops and equipment at a higher rate than the enemy could.[8:206] While many of the material conditions of warfare

changed between Napoleon's time and 1944, including industrialization and speed of transportation, the requirement for movement at all levels of war, had not. Despite the logistical debacle of the summer following OVERLORD, strategic lift assets had placed enormous quantities of supplies on or near the seaports. The strategic success and operational failure along with the realization that the industrial capacity of a country had come to be a full partner in the art of war, are the chief lessons of the Normandy invasion.

The two preceding illustrations offer cases where the importance of preparation for war and of strategic lift, were understood and acted upon, though with different results. WWI offers a significant contrast:

The United States was virtually without a merchant marine. At the beginning of WWI, American cargo was left stranded on piers for lack of transport, and we were charged exorbitant fees by foreign ship operators to carry United States soldiers to Europe to fight for the Allied cause. We could not build merchant ships quickly enough to serve, and the remains of many of the hundreds of emergency-built merchant ships delivered too late for service in the "Great War," still litter the mud flats of the lower Potomac River, in mute testimony to the folly and the cost of failing to sustain in peace the assets required to defend freedom in time of war. [36:6]



This was a national disgrace and an appalling waste of resources. The United States had to contract with foreign governments and commercial firms for the means of transport to a war fought to preserve those states. The experience apparently served little purpose, since this country remained unprepared to mobilize and repeated the same mistakes at the beginning of WWII. It is ironic that, despite the experience of two world wars and two major combat actions in the Far East, we are only slightly better off today. The United States, to some degree, still relies on foreign governments for much of its strategic mobility. Moreover, this reliance on friendly foreign governments does not come without a price. We are contracted to pay for the right to defend allied nations' homelands if we use their vessels. The conditions and consequences of this arrangement will be examined in more detail further on.

The problem of force deployment today is different than that of WWII and other wars this country has fought. The intercontinental missile, a well prepared set of adversaries, global communications, economic interdependence, and our doctrine all demand rapid mobilization and deployment, once the necessary political decisions are made. The fundamentals, however, apply as much today as they did 150 years ago:

As an army advances and removes farther from its base, it becomes the more necessary to have a good line of operations and of depots which may keep up the connection of the army with its base.[2:262]

it appears that wherever an army must fight or be positioned, it will always be tethered to its source of supply. The obligation, then, of the combatant nation is to develop and maintain a means of moving supplies and other materials where they are needed in time to be effective.

This mission for the United States today is to move our forces by a combined means:

U.S. military strategy requires the capability to deploy forces rapidly and then sustain them. Air, sea, and land mobility forces must be able to deliver where they are needed in time to make a difference. Strategic and theater airlift will generally transport deploying forces during the early days of a crisis until surge sealift arrives with the bulk of the deploying units equipment. Sealift delivers follow-on forces and provides the sustaining power for deployed forces.[38:75]

To provide a comparison of the two modes in major overseas deployments, sealift will deliver about 95 percent of all dry cargo and 99 percent of all petroleum products. [35:76] The remainder will be delivered by airlift. To achieve our national defense aims both forms of mobility are essential. We must be able to deploy to overseas theaters quickly with a credible force and be robust enough to remain there until completion. Airlift provides the nation the ability to move forces or materiel very rapidly to diverse regions of the world to show our resolve or to honor a commitment. It is occasionally used for non-military

purposes. The most famous of these and the first large scale demonstration of the value of airlift is the Berlin Airlift. It may be argued whether this was a tactical or strategic use of airlift, but its purpose was clearly strategic. This operation involved a contest of wills between the Allies and the Soviets. It provides us with an excellent example of the flexibility and responsiveness of airlift.

A series of moves and countermoves by the Allies and the Soviets officially over the form of currency to be used in Berlin led to the closing of Berlin to all ground traffic on 24 June 1948. Air access to the city was not lost because it was provided for by treaty. The other two means, road and rail, were not. What was at stake was not a contest over legal rights, but a struggle over Germany and Europe.[6:6]

The reaction of General Lucius Clay, the American military governor, was to propose forcing an armed convoy through the blockade of the autobahn. This proposal met with an unfavorable response from the other Allies who supported an airlift to supply the city. General Clay was skeptical of this solution because of previous failures during WWII over long periods of time. In the face of much American opposition and with little guidance from Washington, General Clay began the airlift against his own better instincts. He had few resources, 102 airplanes with a capacity of 700 tons per day, and a requirement for 13,000 tons of supply

per day. President Truman, rejecting the advice of his cabinet to abandon Berlin, proceeded with the airlift. He also overruled the Joint Chiefs of Staff (JCS), who were fearful that providing all available cargo planes for the airlift, placed them at too great a risk. General Clay thus received the planes he requested. Eventually, the remaining obstacles were overcome and the project received expert management and administration until the Soviets finally agreed to once again grant access on ground routes to Berlin.[21:8]

This operation demonstrates a number of points regarding the uses of strategic airlift, but flexibility gained through timeliness and speed are the ones observed most often. The case also showed that airlift is more resilient than most experts believed. Two years later the Korean war made logisticians consider what would have happened if a second crisis had developed at the time of the airlift. Although the Berlin Airlift was a very successful demonstration of the virtues of air transport, it was also a demonstration of the vulnerabilities of this mode of resupply.

### III. SEALIFT

The backbone of strategic mobility is sealift. The air component provides the speed necessary to get to our objectives.

It is sealift, however, that allows us to stay there. Secondly, while it isn't as fast as air, the time cost of ocean mobility can be reduced with current technology. This will be discussed further on in the paper. In his work on The Causes of Wars and Other Essays, Michael Howard states that "what proved to be of the greatest importance was the capacity to bring the largest and best-equipped forces into the operational theater and to maintain them there." [3:103] The key here is the verb to bring. Howard's observation refers to the ability of the North to bring its tremendous industrial might to bear on the South during the Civil War. Since we cannot move our resupply into overseas theaters by land, we must use more appropriate means. The task, however, is still the same, and our intention is for the outcome to be also the same.

The United States currently has under its direct control 445 vessels of various types and purposes. The three basic categories of these vessels are bulk cargo, petroleum tankers, and others. [33:12] These vessels are also active, meaning that they require little time to prepare for service. This analysis does not assume that they are in position to be immediately useful. These vessels translate to a shipping capacity of 20.5 million tons. [33:13] When a stricter criterion of military usefulness is applied, these numbers are reduced to 367 vessels and 12.1 million tons, respectively. [33:16-17]

The term "militarily useful" is derived from the Joint Chiefs of Staff. It specifies a desired cargo capacity, upper and lower size limits, and an implied draft depth that allows these vessels to enter the greatest number of ports in likely theaters. Further compounding the problem of military utility is the technique of containerization. Container shipping is useful for bulk cargo, but of little value in shipping unit equipment.

There are other sources of military useful shipping available to the United States. These are from three different sources: the Inactive Fleet, allied shipping, and the Effective US Controlled Fleet. The Inactive Fleet is a reserve of shipping in anchor around the country and requiring differing activation times. Allied shipping refers to vessels which are to be provided for our use by NATO nations to conduct our reinforcement and sustainment of Europe. Effective US-Controlled ships are owned by US companies but, for commercial reasons, are flagged in other countries. These sources provide, respectively, 230 vessels, 458 vessels, and 123 vessels.[33:14-15] This amounts to 1178 vessels for the United States roughly within the first 60 days of conflict. Total tonnages are not available as the allied vessels are only guaranteed by quantity and type, not capacity. The remainder would add three million dry tons and 400,000 tons of petroleum to the total of military useful cargo.[3:16-17]

A variety of factors must be kept in mind when considering the use of this source of strategic lift in time of war. First, the types of ships represented are predominantly for dry cargo and petroleum products. Certainly, that is what is most needed for war, but there are almost no passenger (troop) ships. Present mobilization plans call for replacement personnel to be transported exclusively by airlift. This becomes an unreliable choice if our enemies wage an extensive air campaign or deny airfields as ports of debarkation. The active portion of the fleet is expected to decline to 93 cargo vessels and 74 tankers by the year 2000. [33:14-15] This reduces shipping capacity to only five million tons. The inactive fleet will not decline because the vessels that leave the active fleet are placed in the National Defense Reserve Fleet (NDRF), provided they meet certain age criteria. The NDRF could increase with these additions. Unfortunately, the Maritime Administration has no plans nor funds to acquire additional ships for the NDRF. [32:33] According to the President's Commission on Merchant Marine and Defense, the allied contribution to our maritime needs will remain constant through the year 2000. The Commission's assumption is easily assailable since our allies will probably be unable to provide the agreed to number of ships in the future. Our European allies' maritime trends are similar to our own severe down trend for the next 11 years.[32:30]

There are some difficulties with depending on allied shipping for our national requirements and to a lesser degree for airlift reinforcements. First, this reliance assumes timely allied government decisions, which will allow the US speedy access to these vessels. Next, it is difficult to predict the location of these vessels when they are needed. A Belgian ship in Singapore fully loaded with commercial cargo is not of much use to our defense establishment when it's needed in Houston. Our national defense strategy expresses a capability of deterrence; fighting, if necessary; and ending the war on favorable terms. Implicit in this is a multi-theater capability despite the fact that shipping reinforcements from our allies are permitted to go only to one theater, Europe. Finally, this program is not without cost. Just as this country went to WWI begging for strategic shipping and ended up paying our allies for this service, we rely on similar arrangements today.

The next source of shipping available to us is known as the EUSC (Effective United States Control) vessels. These are ships that are owned by United States corporations but are "flagged" by foreign countries and normally crewed by non-Americans, for business reasons, primarily cost. The dominant countries of flagging are Panama, Honduras, Liberia, and the Bahamas. They represent 30 percent of the available military useful tanker fleet. Since these vessels are like the allied vessels in terms



of their availability, they, too, are of questionable reliability. Many of our deployment plans rely on these vessels for necessary force sustainment. Like our own fleet, this source will also decline by the year 2000 by an estimated 33 percent. [33:15]

It would be naive to think that the only need for strategic ships is what the nation requires for pure military purposes. What has yet to be mentioned is the continued requirement to maintain our domestic economy at wartime production rates so that it can support the war effort and the domestic population. It is difficult to provide an accurate number of ships required for this purpose. Some of this requirement can be met by foreign flagged vessels and those ships that don't fall into the military useful categories. Bulk tankers are the best available example of competition for like vessels:

The 193 tankers needed for domestic economic support would include 134 HSTE of military useful tankers, or about 3.7 million dead weight tons. The remaining portion of the domestic tanker requirement could be met by tankers over 100,000 deadweight tons. [32:21]

Handy Sized Tanker Equivalents (HSTE) is a technique used to provide a basis for standardizing bulk tankers for military planning purposes. It has a specified weight and carries 200,000 barrels of liquid.

Cargo needs for international trade at the initiation of hostilities are estimated at 9.8 million tons.[32:21] An unspecified amount of this will compete with military requirements. As stated previously, many domestic needs can be satisfied with a combination of foreign flagged vessels and those ships of little or no military value.

The state of readiness of the shipping industry has two components: shipping and the labor or crews necessary to sail the ships. Sailing as a profession has seen a significant decline in recent years, particularly among American mariners. Long cruises, competition from foreign sailors, higher wage demands for union sailors, and automation have all contributed to this decline. Current estimates are that this work force has declined by 70 percent since 1970.[32:33] Supporting a global war would require a minimum of 27,500 seaman.[32:22] This number could change because of the types of vessels and their characteristics. So little of the merchant fleet is standardized that a finite number of crewmen or skills is difficult to determine. Maintaining the nation's economy is estimated to need an additional 7100 seamen.[32:22] Contributing to these manpower requirements are the needs to man older WWII cargo ships which use cargo handling and propulsion systems that are unfamiliar to today's merchant marine. Activating the Ready Reserve Fleet would require labor that is not necessarily familiar with the

machinery and that is not in employment today. To overcome these problems, a training period would be necessary to activate this fleet which is not provided for in its activation schedule--the 5, 10, or 20 day recall period of the ready reserve. This very ambitious schedule is of questionable credibility.

Just as the number of seamen has declined since 1970, the prospects for the future are not any better. Our current known shortfall is 1437 mariners.[33:42] By the year 2000 that number is projected to climb to 12,000.[33:43] Here again the number of qualified seamen is declining for a variety of reasons that are not likely to be reversed soon. The work force is aging and is not being replaced by American seamen. The danger of using non-American crews is that their reliability in wartime is questionable.

Sealift, as seen here, provides us with the bulk for lengthy operation. Unfortunately, it is deteriorating so much of both equipment and work force, that it is no longer credible as a war fighting tool. A brighter picture is that of the other leg of mobility, airlift.

#### IV. AIRLIFT

The second component of strategic mobility is airlift. This type of mobility provides the speed and agility necessary to

respond to a great number of conditions worldwide and to project quickly power beyond a port and farther inland if required. To accomplish this the Department of Defense, together with the services, has a stated requirement of 66 million ton miles per day.[38:75] This figure is a fiscal trade off directed by Congress as a result of the Congressionally Mandated Mobility Study (CMMS) completed in 1981. While this figure is very difficult to define in precise terms of what it represents in exact cargo capacity, its value is that it clearly states a capability goal. That goal is constantly being reviewed by the Congress and the DOD. The term 66 MTM/D merits an explanation. The easiest way to explain what it represents is in negative terms. It does not mean that the Air Force has the capability to move 66 million tons of cargo daily. It simply means that the Air Force has the theoretical capability of moving one ton 66 million miles in a given day. There isn't much utility in that kind of number, but it does establish a goal. For example, the cargo capacity of a C-5 aircraft for one 2500-mile trip is 82.8 tons. That, multiplied by the 81 C-5 aircraft on hand, would provide just slightly over 6700 tons daily, assuming they were all available for that mission.[27:2-10] The 66 MTM/D goal is not expected to be achieved until the end of this century.[38:75] The mere existence of a recognized requirement, however, is a significant contrast to the sealift segment of mobility which has no stated objective.

The value of the figure for the Air Force is that it can be translated into a precise requirement for air frames and that it helps to establish a schedule for procuring these frames. One must also understand that 66 MTM/D is not our actual need for worldwide mobility, but only expresses an amount of airlift that can be purchased within the congressionally mandated timetables. It trades off military risk and total requirements for affordability. The true needs of the services are seldom expressed because, as estimators struggle to find that need, any change in scenario assumptions will drive that number in different directions. The least demanding scenario used in the Congressionally Mandated Mobility Study required 83 MTM/D to meet stated delivery dates of needed combat forces.[5:373]

One of the difficult aspects of discussing airlift needs, shortfalls, and problem areas, is obtaining consensus on what the airlift requirement really is during wartime. More than 150 studies in the past 15 years have proclaimed shortfalls in both intertheater and intratheater airlift and most people now recognize that we don't have enough airlift capability to deploy, employ, and resupply the combat forces this country possesses. . . and the C-5/Boeing 747 controversy in the Congress reconfirmed a lack of accord on either airlift capabilities or requirements.[5:371]

Today the Air Force has a capability of 47 MTM/D. That capability comes from a variety of different air frames. The C-5 fleet provides 19 MTM/D, assuming full availability. The C-141,

with the largest number of air frames, provides approximately 12 MTM/D.[38:76] These two workhorses are augmented in a number of ways by other types of Air Force aircraft and certain enhancement programs that come from the civilian airline industry. These add-ons, called the Civil Reserve Air Fleet (CRAF), provide an additional 12 MTM/D.[38:76]

The CRAF program has a number of advantages. First, it is relatively easy to activate. The first two phases require only a decision of the Secretary of Defense. Next, the enhancement comes with some financial incentives to the air carrier to continue in the program. While this incentive is not sufficient to keep a marginal operator in business, it is a more substantial reward than that given to the maritime industry; and it does, to a degree, ensure that this fleet will be there when called upon. The airlift leg is also supplemented by American allies. Again, the capacity of this contribution is expressed in numbers of aircraft, not cargo capacity. Currently, 11 nations have committed a total of 28 cargo, 53 passenger, and 12 combination aircraft.[30:25] The Korean Government is also a participant in this program with nine unspecified aircraft thus far.[30:25] Also like the supplement of shipping, these aircraft cannot be used except in their theater of origin. They are also subject to the same pitfalls and restrictions that affect our shipping augmentation: reliance on timely political decisions, no control of initial location, etc.

To illustrate the impact of airlift capability for Army purposes, a study showed that moving the 4th Infantry Division from Ft. Carson, Colorado to Europe under ideal conditions requires 227 sorties of C-5's, 823 C-141's, and 77 large-body aircraft under CRAF stage III conditions.[28:3] This support would give the division a closure time of 10.5 days. It would also occupy every airplane in the inventory.[28:38] The study gave no crew costs.

Other options to deploy the division using more economical modes in combination, sealift and airlift, were also examined. They required more time to close on the destination. This balanced deployment, using a combination of airlift and sealift, extends the closing time of the division, to 17 days.[28:44] This includes all home station loading times, transit to ports, crossing times, and port clearing. It does not allow for any preparation time of equipment at the receiving port or other pre-combat checks. While the study concluded that it is possible to conduct this type of deployment by air, the demand on the airlift system is so great that:

This method would deny these premium airlift assets to any other unit deployment or logistical support requirement for the duration of the deployment.[28:59]

This is a kind way of saying that this method of deployment is not the preferred course of action. The study suggests that

other means would provide closing times adequate to the task and would improve the chances of getting complete units to their destinations. A mixed approach would also improve the likelihood that these aircraft would be available for other missions during the deployment.

The Congressionally Mandated Mobility Study, referred to earlier, and all the other contemporary works that examine the status of this nation's strategic mobility, generally speak well of the value of airlift. They also caution in the end that "by far the most expensive form of mobility is airlift." Twenty-five million ton miles per day of outsized austere airfield capability would cost in a range of 33.7 to 41.7 billion in 1992 dollars."[31:20] This is in contrast to a "very fast sealift ship with 100,000 ton capacity which would cost \$9.6 to \$23.6 billion and has a crossing time of three days to Europe." [31:20] The cost ranges are caused by the different types of options that are available within each form of transport.

These values must be weighed in all of their applications. While the airlift option is initially the most expensive, it might be more economical in the long run:

The timely arrival of forces may preclude the need to deploy many more forces later to force entry and recover lost territory and may prevent or limit damage to the territory and population we wish to defend.[31:17]



The assumptions for this (CMMS) study were all reasonable and are those that are normally used in these works. Unfortunately, their classification prevents them from being used here. The scenarios used are also frequently seen in much of our planning in that they extend to the most planned for theaters, Europe and Southwest Asia, with variations on the form of the enemy causing the difference in each case.

As seen through the eyes of the Commander of the United States Transportation Command, General Duane Cassidy, the resolution of the airlift goal is the C-17. "The C-17," according to General Cassidy, "remains the cornerstone of our plan to attain the 66 MTM/D." [30:15] The C-17 has some capabilities that not only answer strategic lift needs of the services, but also provide theater-level commanders tactical mobility heretofore unavailable to them. For all its technological potential, the C-17 only partially answers our constrained airlift requirement for a price of 37.5 billion dollars in 1986 money. [10:21]

This aircraft will round out the TRANSCOM airlift program by carrying one-third of the 66 MTM/D goal. [38:76] Through the use of airlift within the next ten years, we can get some of our forces to a number of theaters very quickly and may prevent the need for larger numbers of forces to be inserted later at a greater cost in life and degree of difficulty. This combination

of speed and flexibility may be enough, but the facts indicate that we have already spent, and will continue to spend, an inordinate amount of money on a five percent solution to our mobility requirement. Further, this most expensive option will provide us with less than full capability for our least demanding scenario. It is also questionable that this form of mobility provides us with any utility for the movement of operational sized forces unsupported by prepositioned equipment.

This type of solution also draws one to a conclusion that perhaps we are not interested in an operational solution to our mobility shortfall. Rapid means of deployment, aircraft, are usually reserved for those forces that do not need great volumes of sustainment and are not intended to remain in their theater for long periods. Such forces also will lack most forms of battlefield mobility which poses questions of their utility beyond a short skirmish. It is outside the scope of this work to assess our force mix, but I use it as a testimony to our continued presumption of a short war.

One option to augment the advances in airlift capability is the controversial surface effects fast sealift ship. This vessel has some very impressive performance characteristics. It is capable of 55 knots, compared to 30 for those fast-lift ships (SL-71) currently on hand. It can carry 5000 tons over a range of 3500 nautical miles. It is also able to gain access to a far

greater number of ports than other fast sealift because of its ability to raise and lower itself in the water.[17:92-94] Finally, it can be procured for about the same cost as two C-17's.[17:96] The drawback to this vessel is its questionable reliability in rough seas. Current estimates are that it cannot operate in the North Atlantic for more than 25 percent of the year. That is not very impressive on the surface; but other regions of the world, where seas are normally calmer and where we have a smaller prepositioning investment, may benefit from a vessel of this type.

#### INSIGHTS AND CONCLUSIONS

The United States plans to fight its future wars in an overseas theater. Only one of our unified commands has an area of responsibility for the continental United States, even though the defense of our homeland is our first stated national priority. Therefore, we fully accept the need for our armed forces to be prepared to deploy to any of a number of conflict likely regions of the world.

There are a number of things necessary to fulfill this requirement: sound strategy; well understood doctrine; forces configured to the potential missions; and to the point of this

effort, the capability to move our forces to a designated theater. Movement itself must be fast, in sufficient numbers to be effective, and capable of sustaining deployed forces to remain there to or beyond conclusion. It is a given that the preparation for war is an expensive undertaking. In this pursuit we have taken great leaps forward in how we expect to fight and what we expect to fight with in a number of potential cases. We continue to revise our doctrine to reflect our national desires. Our equipment has and is continuing to be modernized, and our force structure mix receives constant review and adjustment. What has received scant attention beyond the review and analysis forum is our ability to project our forces. For a number of reasons, we fall into a quagmire when we discuss the issue of strategic mobility. First, there is no national transportation policy in this country that clearly addresses military needs in either peace or war.

National Transportation policy of the United States states that we will rely on the private sector to meet the national requirements for transportation and the government will intercede only when the private sector can't meet these needs. For this reason we don't have the nationalized railroads, airlines or steamship lines like most of the countries of the world.  
[19:4]

This isn't a boost for nationalizing the nation's transportation industry, but the nation must remedy the lack of clear direction

for the industry and, more specifically, the result of that condition on our strategic mobility. No competent study of sealift or airlift disputes the fact that there is a shortage of mobility assets. The precise volume of this shortfall remains in question, partially because the assumptions are always different. To provide some perspective of the overall magnitude of the sealift shortfall, the Commission on Merchant Marine and Defense concluded that for a global conventional war:

The current equipment sealift capability is slightly less than 800,000 short tons, or only 35 percent of the global war requirements. United States ammunition and resupply capability is about 3.5 million short tons, only about 61 percent of the global war requirement.(32:45)

The Commission further stated that allied help would raise these totals to the point that ammunition resupply will exceed our early requirements. It also cautioned, however, that this estimate was based on a best case analysis without any friction. This condition is not expected to improve over time. The number of US flagged cargo ships is projected to decline by 65 percent by the year 2000, again leaving us in a deficit posture.(32:47) This projection was also done in very favorable terms.

Conversely, airlift is showing signs of progress in all of its programs. The Air Force currently believes that it will meet the FY 88-92 Defense Guidance and have 51.4 MTM/D capability by

FY 92.[30:15] This keeps them on schedule toward the 66 MTM/D goal by the year 2000. While this is a positive trend, it is still far short of our needs. There are also other difficulties with airlift in that we are counting on this mode of transportation to move our light forces worldwide and "large formations with little mobility are the antithesis of Airland Battle doctrine." [10:12] To be effective, strategic mobility is not a single dimension enterprise, it must use all of its components to be successful. Airlift will get us there quickly, but it is "fast sealift that generates strategic mobility more quickly and efficiently for operational sized units than does airlift." [10:23]

The United States has several options available to remedy the lift shortfall. One is to continue as we are and allow our strategic fleets to diminish. However, a very simple fix would be to negotiate with our allies to use their lift assets in other theaters. For example, an American response to a crisis in Southwest Asia could well be in our European allies' interests. The cost of using some of their ships and airplanes, for which we currently pay a fee, may be an inexpensive way for them to contribute.

A more difficult option, because it requires many political and budgetary decisions, is to reduce the number of C-17's under procurement. For the cost of 12 C-17's we could have a second

group of eight SL 7-type ships that would provide us with a second division worth of equipment for any theater.[10:22] The C-5 also offers financial savings and increased cargo capacity. Granted it does not have the intratheater and airfield performance capabilities, the C-17 will, but would save \$63 million per aircraft.[10:22] I am not proposing elimination of the C-17 program. There is most definitely a place for it in strategic and theater mobility. Reducing C-17 procurement does, however, offer options to improve our deployment capability and achieve cost savings in the process. In assessing these options, there are some drawbacks. I can see no military disadvantage to another set of SL 7's. The cost for delivery is most effective, but these vessels do have a high operating cost which makes them commercially of no value. The C-5 for C-17 option would reduce the theater commanders' flexibility for intratheater missions, but at the same time would provide him some potential for critically needed equipment from the CONUS support base.

Between the Spanish-American War and WWI, we had little to be proud of in getting our forces and their sustainment where it was needed and on time. WWII was a slightly better beginning because we realized it was only a matter of time before our backing of the British would have to involve our forces. Historically, the United States has relied upon its industrial base to provide all of the tools of war after mobilization begins. World situations

will not allow us the luxury of taking a year or more to gain a wartime production capacity just to provide the means of transporting combat forces to a theater of war not of our choosing. There is no guarantee that the next war will take place according to our plans. We have accepted our position of world leadership with all of its demands, but with little apparent desire to live up to those demands in every respect, and little hope of meeting our deployment plans.



## GLOSSARY

Breakbulk Ship: A vessel designed to carry breakbulk cargo and capable of loading and unloading that cargo with its own equipment, without resorting to shore-side cargo handling equipment.

Container Ship: A vessel designed to carry standard modular cargo containers, enabling efficient loading, unloading, and transportation of the cargo to and from the vessel. Such ships are defined as either "Self-sustaining" (able to load and unload containers using their own cargo handling gear), or "Non-self-sustaining" (dependent on shore-side or other off-board cargo handling equipment).

EUSC (Effective US Controlled) Fleet: Those merchant vessels owned by US citizens or corporations, but registered under "flags of convenience" (usually defined as those of the Bahamas, Panama, Liberia, and Honduras) whose ship registration laws do not interfere with the activities of foreign-owned ships. The term is used to emphasize that, although the EUSC fleet is not US flag, it is considered to be effectively under United States control by virtue of ownership and could be requisitioned by the United States Government in time of war or national emergency. Also referred to under the acronym USEC (US Effective-Controlled).

LASH (Lighter Aboard Ship): A specific type of general cargo vessel intended to transport barges loaded with cargo. The barges of about 400 tons capacity, are floated to and from the ship and loaded or unloaded by a heavy-lift, traveling crane at the ship's stern; the crane positions the barges aboard the ship, where they can be stacked in multiple levels. Most LASH ships have now been converted to handle containerized cargo as well.

NDRF (National Defense Reserve Fleet): A fleet of inactive merchant vessels maintained by the Maritime Administration at three layup sites: James River, Virginia; Beaumont, Texas; and Suisun Bay, California. NDRF ships are considered to be reactivateable in 60 or more days and are intended to be used as attrition replacements or in economic support service.

Ready Reserve Force (RRF): A navy-funded, Maritime Administration-managed program to maintain inactive merchant ships in a state of readiness that would permit their activation within five, ten, or twenty days after notification.

Roll-on/Roll-off (Ro-Ro) Ships: General cargo designed to allow trucks or other vehicles to drive on and off with (or as) cargo via ramp systems.

SL 7: A specific class designation for a group of eight container ships built during the 1970s for commercial service and capable of 33-knot maximum speeds. All were later purchased by the Navy for Military Sealift Command service and converted as vehicle and container carriers for rapid-deployment support of Army forces. As naval ships, they have been given hull numbers in the T-AKR series. Also described as Fast Sealift Ships (FSS), they are normally maintained in Reduced Operating Status (ROS).

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